

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
250V	18.5mΩ@10V	80A

## Feature

- Excellent gate charge  $\times R_{DS(on)}$  product
- Very low on-resistance  $R_{DS(on)}$

## Application

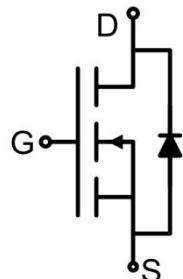
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

## Package

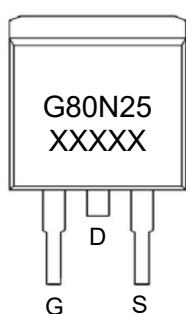


TO-263AB

## Circuit diagram



## Marking



## Absolute Maximum Ratings (T<sub>c</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	250	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	80	A
Continuous Drain Current(T <sub>c</sub> =100°C)	I <sub>D</sub> (100°C)	56.6	A
Pulsed Drain Current	I <sub>DM</sub>	320	A
Power Dissipation	P <sub>D</sub>	300	W
Thermal Resistance,Junction-to-Case <sup>1)</sup>	R <sub>θJC</sub>	0.5	°C/W
Single pulse avalanche energy <sup>4)</sup>	E <sub>AS</sub>	1200	mJ
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

## Electrical characteristics (T<sub>c</sub>=25 °C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	250			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =250V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage <sup>2)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.5	3.5	4.4	V
Drain-source on-resistance <sup>2)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =40A		16	18.5	mΩ
Forward transconductance <sup>2)</sup>	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =40A	70			S
<b>Dynamic characteristics<sup>3)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =125V, V <sub>GS</sub> =0V,f =1MHz		5400		pF
Output Capacitance	C <sub>oss</sub>			329		
Reverse Transfer Capacitance	C <sub>rss</sub>			12		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =125V, V <sub>GS</sub> =10V,I <sub>D</sub> =40A		76.7		nC
Gate-Source Charge	Q <sub>gs</sub>			22.7		
Gate-Drain Charge	Q <sub>gd</sub>			20		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =125V,V <sub>GS</sub> =10V, I <sub>D</sub> =40A,R <sub>G</sub> =4.7Ω		18		nS
Turn-on rise time	t <sub>r</sub>			26		
Turn-off delay time	t <sub>d(off)</sub>			41		
Turn-off fall time	t <sub>f</sub>			11		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current <sup>1)</sup>	I <sub>s</sub>				80	A
Diode Forward voltage <sup>2)</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>s</sub> =80A			1.2	V
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, I <sub>F</sub> =40A di/dt = 100A/μs <sup>2)</sup>		140		nS
Reverse Recovery Charge	Q <sub>rr</sub>			600		nC

Notes:

- 1) Surface Mounted on FR4 Board, t ≤ 10 sec.
- 2) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 3) Guaranteed by design, not subject to production.
- 4) EAS condition : T<sub>j</sub>=25 °C,V<sub>DD</sub>=50V,V<sub>G</sub>=10V,L=0.5mH,R<sub>g</sub>=25Ω.



## Typical Characteristics

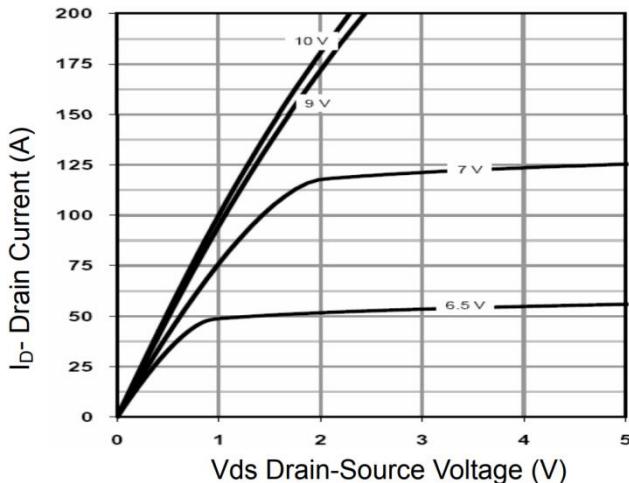


Figure 1 Output Characteristics

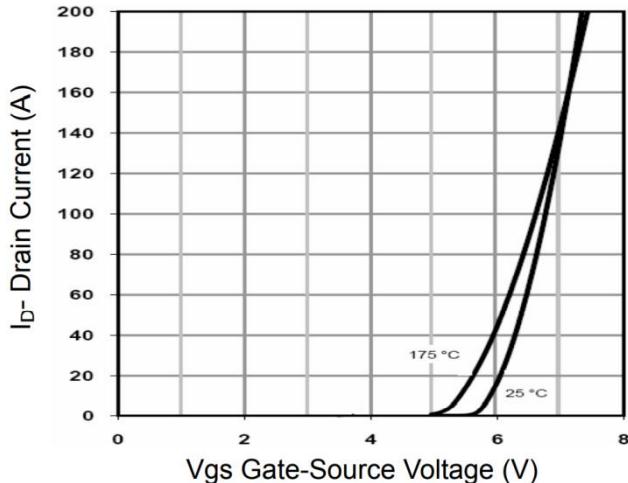


Figure 2 Transfer Characteristics

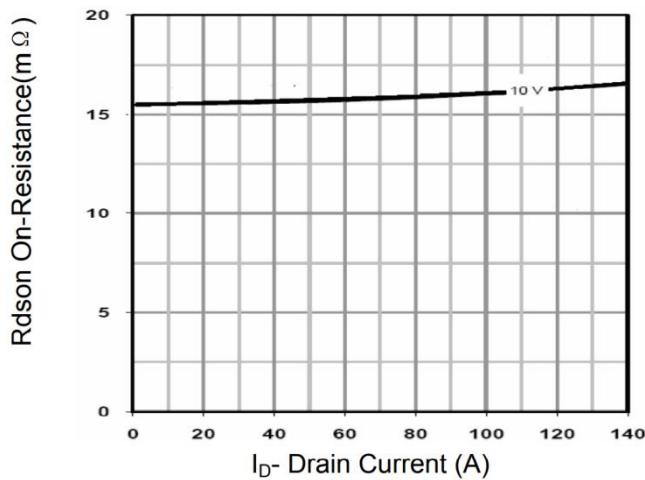


Figure 3  $R_{DS(on)}$ - Drain Current

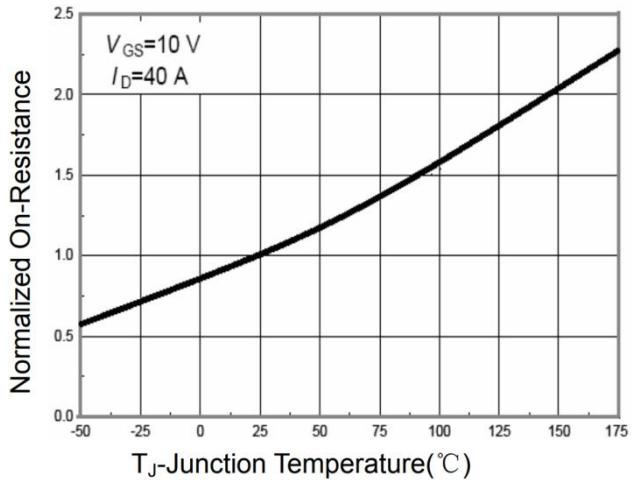


Figure 4  $R_{DS(on)}$ -Junction Temperature

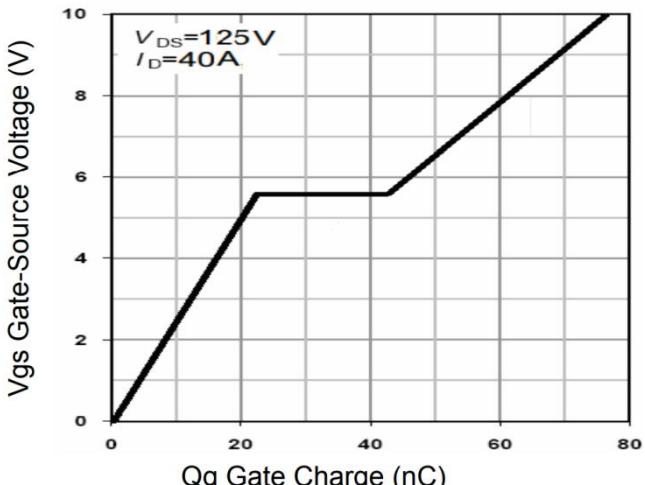


Figure 5 Gate Charge

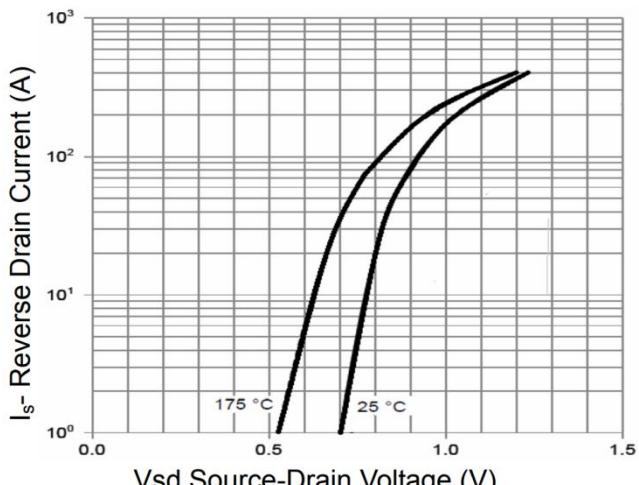
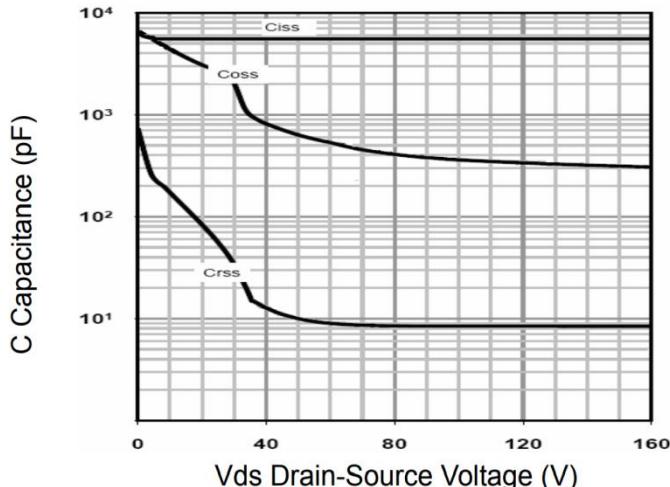
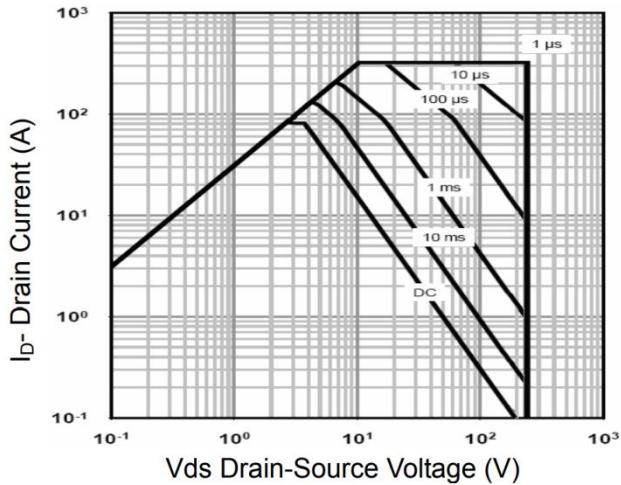


Figure 6 Source-Drain Diode Forward

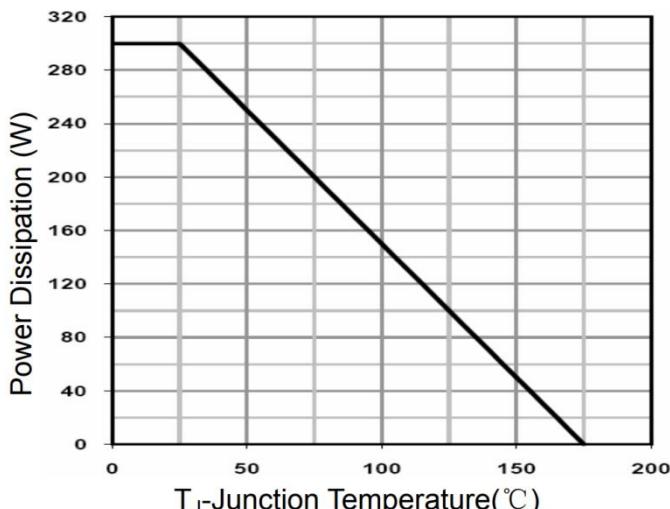
### Typical Characteristics



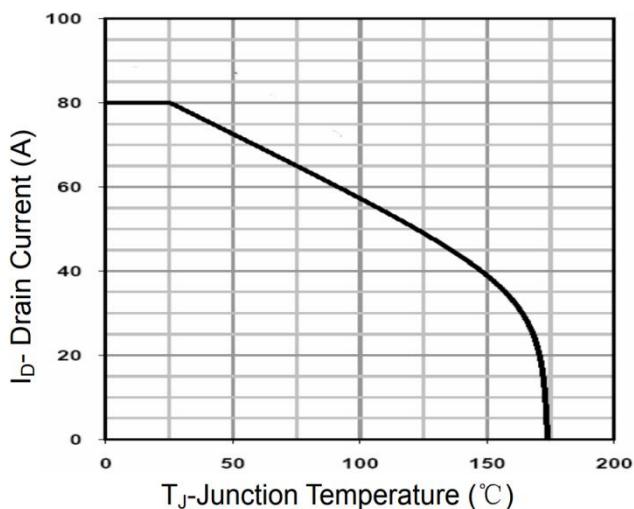
**Figure 7 Capacitance vs Vds**



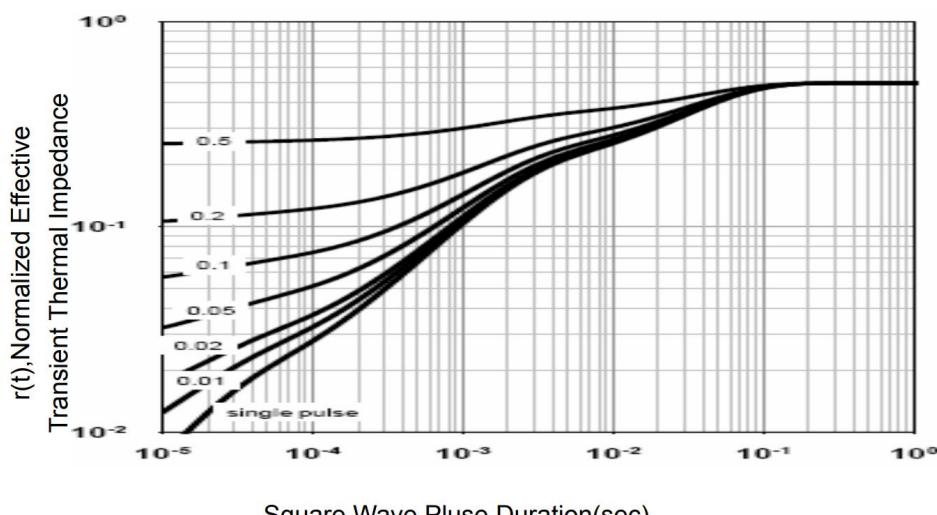
**Figure 8 Safe Operation Area**



**Figure 9 Power De-rating**

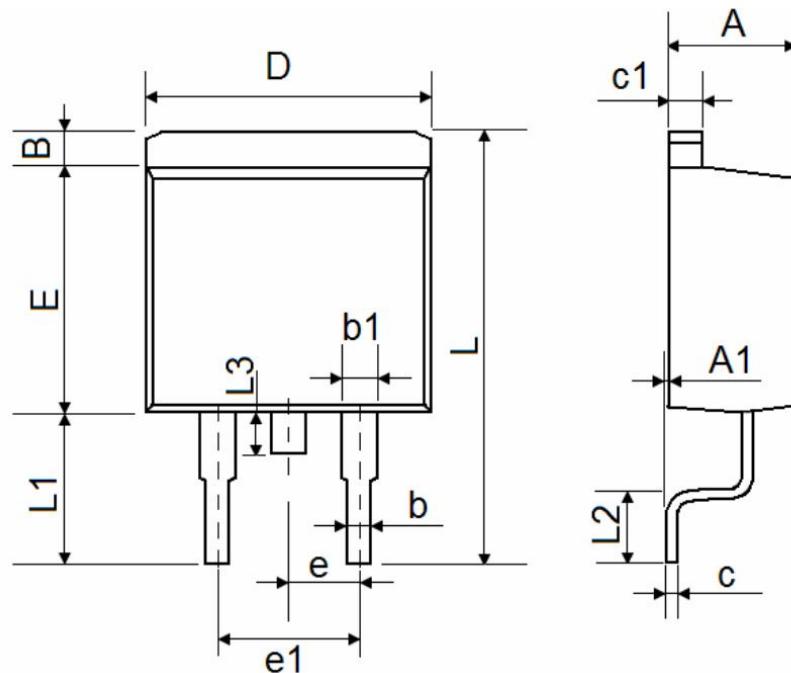


**Figure 10 Current De-rating**



**Figure 11 Normalized Maximum Transient Thermal Impedance**

## TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.170	1.370	0.046	0.054
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	15.050	15.450	0.593	0.608
L1	5.080	5.480	0.200	0.216
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067